ISO/IEC Workshop on Worldwide Recognition of OSI Test Results

Regional Progress - North America

September 15, 1993

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Abstract

This paper presents a summary of the developments in North America towards harmonization of testing and certification/registration in the information technology field. The current status follows an intense period of activity to develop North American regional strategies favorable to future multilateral recognition of national/regional certificates/registers on a global basis. Special emphasis is given to the consolidation of profiles via the design the Industry/Government Open Systems Specification (IGOSS), the quality improvement of the Government Open System Interconnection Profile (GOSIP) Testing Program and the creation of the North American Open Systems Testing and Certification Policy Council as the basic steps towards achieving worldwide recognition of test results.

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1.   Introduction

This paper[1] presents a summary of the developments in North America towards harmonization of testing and certification/registration in the information technology field. The current status follows an intense period of activity to develop North American regional strategies favorable to future multilateral recognition of national/regional certificates/registers on a global basis. Special emphasis is given to the consolidation of profiles via the design of the Industry/Government Open Systems Specification (IGOSS), the quality improvement of the Government Open System Interconnection Profile (GOSIP) Testing Program (planned to become the IGOSS Testing Program) and the creation of the North American Open Systems Testing and Certification Policy Council as the basic steps towards achieving worldwide recognition of test results.

The North American Open Systems Testing and Certification Policy Council was established in May 1991 by the Computer Business Equipment Manufacturers Association (CBEMA) and the Corporation for Open Systems International (COS) as a voluntary organization of public and private sector entities to provide a North American focal point for the development, coordination and harmonization of policy as it pertains to worldwide Open Systems Interconnection (OSI) testing and certification.

IGOSS has been jointly authored by the U.S. government, the Canadian government, the Manufacturing Automation Protocol (MAP), the Technical and Office Protocol (TOP) and the electric power industry. Each of these major user organizations has previously issued their own procurement profiles to coordinate the acquisition and operation of computer networking products and services based on OSI.

The Computer Systems Laboratory of the National Institute of Standards and Technology (NIST/CSL) together with its Agent, the Joint Interoperability Test Center (JITC) have been substantially upgrading and expanding the GOSIP Testing Program in key areas such as abstract test suite maintenance, means of testing validation, laboratory accreditation procedures and product registration. NIST/CSL is substantially involved in the process of harmonization with Europe.

During the first International Organization for Standards (ISO)/International Electrotechnical Commission (IEC) Workshop on Worldwide Recognition of OSI Test Results it was recognized [1] that testing of OSI products[2] is expensive and time consuming. Hence there is a great desire on the part of the suppliers of such products to have their products tested only once. At the same time, clients are seeking assurances that newly acquired OSI products will interwork with their existing systems. These two points of view cannot be currently reconciled in the absence of global arrangements on the recognition of the results of testing OSI products. Fundamental to the harmonization of test reports is the harmonization of standardized profiles, a single worldwide set of abstract test suites for OSI conformance testing, mutually acceptable procedures to validate OSI means of testing, and mutually acceptable accreditation procedures. Since the last workshop, much progress has been accomplished to reach these fundamental milestones.

Section 2 discusses the creation of the North American Open Systems Testing and Certification Policy Council, its charter and its objectives. Section 3 presents the progress achieved by the GOSIP Testing Program. The content of this paper is based on activities involving a wide range of North American participants including product suppliers, users, test service providers, accreditation authorities, vendors, procurement agencies, standardizers and certification/registration bodies.

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[1]This work is a contribution of the National Institute of Standards and Technology and is not subject to copyright.

[2]The content of this paragraph has been extracted from the Conference Report of the First ISO/IEC Workshop on Worldwide Recognition of OSI Test Results held at NIST in May 1991.

2. North American Open Systems Testing and Certification Policy Council

The North American Open Systems Testing and Certification Policy Council[3] (referred as Council in the remaining parts of this paper) was formed as the result of an initiative taken by the Corporation for Open Systems International (COS) in the latter part of 1990. This initiative was based upon a perceived need to provide a vehicle to both achieve and communicate a consensus view, within North America, in relation to the growing international activity focused upon testing and certification of OSI products and services.

After producing and circulating a white paper addressing the issues and proposing the formation of the Council, a number of informal meetings of organization with interests in the field were held, commencing in December 1990. There was sufficient agreement that the proposal had merit, and a charter was formulated.

The formation of the Council was formally announced in May 1991. Membership of the Council is limited to representative organizations, rather than individual companies, and is open to all who qualify under the terms of the Charter. Initially there were two Members; the Computer and Business Equipment Manufacturers Association (CBEMA) and COS. The Canadian Interest Group on Open Systems (CIGOS) has since joined, giving the Council a wider geographic scope. In February 1993, the Computer Systems Laboratory of the National Institute of Standards and Technology (NIST/CSL) joined officially the Council. The American National Standards Institute (ANSI) has endorsed the concepts and objectives of the Council, and participates in its activities. Other participation comes from various interests within the OSI community. In May 1993, the Council was approved as a liaison by the European Committee for Information Technology Testing and Certification (ECITC). Thus the Council has increased its geographic scope and has become more broadly representative of user and supplier interest, particularly in the field of OSI, but increasingly in the larger domain of open systems networking.

The Council has focused its efforts on the formation of consensus on various issues of Policy relating to testing and certification of OSI products. It has defined a framework, Policy Document [2] which provides an overview of the OSI support infrastructure which is being built both nationally and internationally. A brief introduction to the Council's Charter and the Policy Document, taking into account both the national and the international perspectives, is given in the next two sub-sections.

2.1. Charter

The Council is a voluntary organization of public and private sector entities with the mission to provide a North American focal point for the development, coordination and harmonization of policy as it pertains to worldwide open systems testing and certification. Its objective is to accelerate the deployment of OSI products through the establishment of mutual recognition between North American and other national/regional test and certification programs, regarding the acceptance of standards, test suites, accreditation, testing and certification. The membership of the Council is open to North American organizations representing industry consensus groups and relevant government activities with an interest in the objectives of the Council.

As stated in its Charter, the Council is a voluntary organization. Any organization retains the right to use or not any policy documents or other documents which the Council develops and approves. Policy and other documents developed and approved by the Council are intended for use in the non-regulated Information Technology (IT) conformity assessment area. The Council is not empowered by any government to negotiate directly with other governments.

2.2. Policy Document

The Policy Document is intended to serve two principal purposes. The first is to establish and document Council consensus on policies and plans for OSI standards, testing and certification activities. The second is to serve as a basis for negotiations by the Council and other regional negotiation bodies with other organizations in order to achieve worldwide harmonization of testing and certification for OSI products. The following sub-sections provide an overview of the Council objectives as they are defined in the Policy Document.

2.2.1. Base Standards

The Council believes that utilization of standards is a business issue that can have a positive impact on domestic and international markets. Properly developed and applied, IT standards, and OSI standards in particular will provide ease

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[3]Most of the text in this Section is directly extracted from the Council's Policy Document and does not imply any endorsement by NIST.

of information interchange leading to a free and open market for IT products. The Council supports the following objectives:

- Development of base standards to meet the needs of users and producers in a timely manner;
- Minimization of overlapping or conflicting base standards;
- Promotion of worldwide voluntary base standards; and
- Inclusion of test and test suite purposes in protocol base standards.

2.2.2. Functional Specifications

The Council recognizes the need for specification beyond the descriptions of international base standards. Sufficient detail is required such that implementations by different suppliers have a high likelihood of interworking over the range of features so specified. The additional specificity should be of the nature of option selection, choice of parameter values, and determination of classes and subset. Furthermore, it is desirable to group the protocol specifications into profiles aimed at satisfying the requirements of specific application environments. As these functional specifications directly impact the content of OSI products, such products are likely to be subjected to conformance and interoperability testing. It is important that the factors relating to such testing are fully taken into account in the production of the functional specifications.

The Council supports functional specifications in a broad practical context of Open Systems Environments (OSEs), and defines the following objectives:

- To conduct regional work on functional specifications and profiles in the Open Systems Environment Implementors' Workshop (OIW);
- To include OSI protocols in profiles with other components of open systems needed to fully address an application area;
- To reach accord with other regional workshops, internationally, on functional specifications of protocols and profiles;
- To support a non-redundant, complete set of International Standardized Profiles (ISPs) that are agreed to by regional workshops; and
- To align OIW functional specifications with published ISPs.

2.2.3. Abstract Test Suites

An Abstract Test Suite (ATS) is the largest most technically detailed part of a test specification. It is itself a standard, applicable to testing a protocol standard according to a given abstract test method.

The Council recognizes that the use of ATSs is very important for a cohesive approach to conformance testing. The Council supports the following general objectives:

- To encourage the development of ATSs within the region and internationally;
- To support international standardization of ATSs; and
- To encourage test and certification programs to use standardized ATSs.

The Council further supports the following objectives related to the production of ATSs:

- ATSs should be aligned with the latest internationally agreed Test Suite Structure and Test Purposes (TSS & TP) standard for each base protocol standard;
- If a functional standard requires changes to base standard ATSs, this should be achieved through the normal defect report mechanism; and
- The ATS specifications should meet those requirements specified in ISO/IEC 9646 Parts 2, 3, and 6 [4].

2.2.4. Means of Testing

For the purposes of test realization the Council recognizes the use of ISO/IEC 9646, *OSI Conformance Testing Methodology and Framework* [4], particularly Part 4, as a basis for developing Means of Testing (MOT). Test realization is the process of producing a practical mechanism for testing products for conformance to OSI protocol specification, based on a conformance testing standard and its ATS. The goal of the Council is to support harmonization of MOTs used for conformance testing worldwide, including 100% coverage of ATSs, thereby accelerating the establishment of one-stop testing.

2.2.5. Test Laboratories

The Council endorses the use of ISO/IEC 9646, particularly Part 5, by all test laboratories in the conformance testing process. The overall goal is to have all test laboratories, worldwide, conform to ISO/IEC 9646 requirements. Specific goals include:

- Requirements as to testability of the Implementation Under Test (IUT) with respect to Abstract Test Methods (ATMs);
- General requirements on the laboratory and client applicable to any conformance testing process;
- Exchange of technical and administrative information, including a System Conformance Statement (SCS), a Protocol Implementation Conformance Statement Proforma (PICS) for each protocol standard and a Protocol Implementation eXtra Information for Testing Proforma (PIXIT) for each ATS to be used for testing;
- Cooperation between the laboratory and its client to reach agreement on the definition of the IUT, the ATMs and ATSs to be used and the conditions under which testing will be performed; and
- Requirements on the structure and content of the conformance test reports that documents the results of the conformance assessment.

2.2.6. Laboratory Accreditation

The Council supports the development of "One-Stop" accreditation by promoting multi-lateral mutual recognition agreements for OSI conformance test laboratory accreditation, based upon the application of the same criteria and procedures in all geographic regions for the assessment of test laboratories engaged in testing in the OSI field.

2.2.7. Agreements Groups for Conformance Testing

The Council recognizes that mutual recognition is the key to achieving the universal goal of "One-Stop-Testing." It is also recognized that there are many components involved in mutual recognition agreements leading to "one-stop testing" (i.e., OSI Certification, product registers, MOTs, laboratory accreditations, etc.).

The Council endorses the establishment of OSI Agreements Groups between North American certification bodies, and the development of general acceptance, by all parties concerned, of the harmonization services offered in the framework of such groups. The endorsement of mutual recognition agreement in OSI should be extended to include all regions worldwide.

2.2.8. Agreement Groups for Interoperability Testing

The main objective of Agreement Groups (RAs) for interoperability testing is to facilitate the goal of "one-stop" interoperability testing using widely accepted procedures and testing. Testing results of one-stop services should be mutually recognized and accepted as valid as if performed within each region. This recognition eliminates duplicative testing and thus reduces the cost of OSI and its time to market. The following goals need to be achieved in order to provide one-stop interoperability testing services:

- Execution of RAs (or their equivalent) between or among service providers;
- Endorsement of these one-stop services and their attendant test suites by procurement profile authorities and other associations requiring OSI testing services; and
- Provision of widely available, and readily accessible, information on the results of interoperability testing.

2.2.9. Certification and Supplier's Declaration

The Council believes that requirements for OSI testing and certification should be formulated to permit access to North America, Europe, Asia/Oceania and other international markets under the best competitive conditions. The Council's goal is the provision of an effective system which will enable the acceptance, in all markets, of suppliers' Declarations of Conformity or certificates issued by Certification Bodies, each one being established on the basis of an OSI conformance test report issued by test laboratories (first, second and third party) that have been shown to operate within some commonly agreed operational framework.

2.2.10. Registers

The Council endorses the provision of at least one register whereby anyone can obtain information relating to OSI products and their conformity to OSI standards. Such a register would identify those OSI products that have achieved a level of conformity that is acceptable by a particular certification body. The Council also endorses the provision of at least one register that contains information indicating products that have undergone successful interoperability testing. The overall goal is to have registers that would be recognized and used worldwide.

2.2.11 Procurement Profiles

Both public and private sector organizations have written OSI procurement profiles that allow those they represent to choose open networking products that meet the purchaser's interworking and other requirements. The Council acknowledges the benefits of such profiles; presenting the standards information in lay terms, describing protocol packaging and options and including non-OSI materials that are relevant to procurement. The Council supports the following objectives with respect to OSI procurement profiles:

- Organizations developing the profiles concentrate their current efforts to consolidate them;
- Procurement profiles reference workshop functional specifications without change; and
- Profiles act as guidance to their constituency while allowing flexibility for local issues.

2.2.12. Change Management

As OSI products become more readily available, there will be increased opportunities to manage problem resolution issues. While various standards bodies are defining standards life cycles, the full impact of problem determination is further compounded by testing and certification. The origin of the problem must be defined, mechanisms must track the problem through final resolution. Implementing changes to a standard should the standard prove "at fault" is well documented. Changes to the tests that will affect product design and delivery are not yet formally addressed. Thus the objectives for change management are:

- To establish well-documented and properly visible mechanisms for reporting, resolving and implementing solutions for problems encountered with any element of the OSI support infrastructure that is subject to standardization, or similar consensus processes;

- To establish well-defined linkages and dependencies between these mechanisms in order that the management of related changes within each may be properly coordinated;

- To obtain global support for the mechanisms defined above; and

- To establish national, regional and international responsibilities for operating the change management mechanisms, together with effective liaison processes between them.

2.2.13. Market Access

The Council seeks fair and open worldwide access to markets for OSI products that conform to internationally accepted specifications, i.e. standards, profiles, etc. This should create conditions which allow companies to compete and users to choose on the basis of product price, performance, quality and service.

3.   The GOSIP Testing Program

In August 1988, the Computer Systems Laboratory of the National Institute of Standards and Technology (NIST/CSL) issued *Federal Information Processing Standard* (FIPS) 146 [3] which specified that Federal Agencies requiring new installations of computer communications equipment shall procure OSI protocols. Today, Federal procurements for communications equipment for which GOSIP functionality is specified shall adhere to the provisions of the GOSIP Testing Program. In particular, GOSIP conformant products must appear on the *Register of Conformance Tested Products*. Interoperability must be demonstrated between different GOSIP product suppliers, specified in this request for procurement, directly to this agency or by recording entries on a register indicated by the *Interoperability Test Service Register.*
    The key to the GOSIP Testing Program is a set of publicly accessible registers maintained by NIST/CSL's Agent, JITC. To monitor and direct staged improvements in the deployed base of GOSIP products, NIST/CSL has established registers for:

- **GOSIP Abstract Test Suites**: This register identifies the test specifications that are to be used to test the OSI products.

- **Protocol Information Conformance Statement**: This register identifies the proformae that should be accepted by laboratories to verify the static compliance of OSI products to the GOSIP profiles. The vendor uses these proformae to make a statement about which capabilities have been implemented for given OSI products.

- **Interoperability Test Suites**: The register identifies the minimum interoperability test suites that must be employed by any interoperability service in order to become acceptable for registration.

- **Reference Implementations**: This register identifies the OSI products that NIST/CSL and JITC use to perform the dynamic evaluation of MOTs.

- **Assessed Means of Testing**: this register identifies the MOTs that have been approved by NIST/CSL. An MOT constitutes an implementation of an abstract test suite for a given protocol and test method.

- **GOSIP Accredited Laboratories**: This register identifies all the accredited laboratories that performed testing for the U.S. GOSIP Testing program.

- **Laboratories Approved for MOT Qualification**: this register identifies the accredited laboratories that can perform MOT assessment for the U.S. GOSIP Testing Program.

- **Conformance Tested GOSIP Products**: This register identifies the OSI products that have passed conformance testing in the context of the U.S. GOSIP Testing Program.

- **Interoperability Testing Services**: This register identifies the organization that can provide interoperability information to complement the conformance testing register. To be in this register does not imply any endorsement from NIST/CSL.

NIST/CSL and JITC with the support of the OIW have been upgrading the U.S. GOSIP Testing Program to reflect inputs provided by the quarterly GOSIP Testing meetings and discussions with the European Community and several accreditation bodies in Europe. The new improvements will facilitate global harmonization of conformance testing and certification/registration.

The U.S. GOSIP Testing Program has established a partnership between groups of users and vendors, and the Federal Government whose purpose is to implement a comprehensive quality process by which (1) vendors are able to demonstrate and promote the quality of their Information Technology (IT) products and (2) users can obtain information they trust on IT products available and that fits their needs and wants. The GOSIP Testing Program helps vendors with access to the world market. Indeed, one of the most visible efforts that NIST/CSL has made over this past two years has been on the international front. NIST/CSL has conducted extensive discussions with the European Community (EC) and its member states, with Canada, Australia, Korea, Taiwan, Republic of China, and Japan, to better understand the IT world market and help U.S. vendors to access foreign markets.

3.1. Harmonization -- Profile Consolidation

3.1.2. North America

This partnership between users, vendors, and the U.S. Federal Government is now taking a much broader scope with the introduction of the Industry Government Open Systems Specification (IGOSS). Today, NIST/CSL partners include the Manufacturing Automation Protocol (MAP), the Technical and Office Protocol (TOP), the Electric Power Research Industry (EPRI) user groups, and the Canadian Government. Discussions are ongoing that could result in the separate addition of the Federal Aviation Administration (FAA). The U.S. GOSIP Testing Program is on its way to become the IGOSS Testing Program and the foundation of the North American OSI Testing Program.

In order to meet IGOSS Testing requirements, the U.S. GOSIP Testing Program plans to upgrade its procedures and include new testing capabilities. These procedures will reflect the scope of IGOSS and the views and concerns of NIST/CSL's partners. Moreover, NIST/CSL intends to continue to discuss any issues with vendors via the OIW. These new technologies will include the Message Handling System 1988 (MHS), Transport Class 2, Integrated Services Digital Networks (ISDN), Frame Relay, Fiber Distributed Data Interface (FDDI), Network Management, Manufacturing Message Specification (MMS), Directory Services (X.500), and Transaction Processing protocols. NIST/CSL will add these protocols to the Testing Program as soon as all the necessary components are identified (i.e., profiles, PICS, PIXIT, ATS, MOT).

At the request of NIST/CSL, the Federal Networking Council (FNC) and the Federal Information Resource Management Policy Council (FIRMPOC) are jointly convening a panel of Federal government experts to reconcile the existence of the two non-proprietary protocol suites (OSI and TCP/IP) for providing data communication among Federal computer systems and to make recommendations concerning future government policy with respect to these protocol suites. This panel will recommend policies which best meet the Federal government short and long-term computer networking requirements. Panel members have been selected by the Director of NIST/CSL. The outcome of this panel should result in recommendations for technical solutions that will accommodate both technologies and provide means for convergence between them. This activity may result in a delay of the release of the draft edition of GOSIP Version 3 and the revised version of the IGOSS until the panel recommendations have been received. In any case, there should not be any drastic changes in the GOSIP Testing program, besides a scope broadening (i.e., inclusion of the TCP/IP protocol suite).

3.1.2. Worldwide

One of the key technical problems that creates barriers to harmonization has been the design of regional solutions. Indeed, while ISO has provided an international forum for the specification of OSI protocols, the three open systems workshops have made regional decisions on how to implement OSI products. Such activity is unfortunately necessary and results from ambiguous and incomplete specifications. This process has resulted in U.S. GOSIP which is different from U.K. GOSIP. Different solutions are not desirable and not acceptable. This places a burden on the vendors that must follow, understand, and implement these solutions. The trend is now to harmonize the different regional solutions and to move to ISPs. This harmonization is independent of the Testing Program, but will provide a boost to NIST/CSL efforts. NIST/CSL expects that vendors throughout the world will use their influence to pressure for testing harmonization.

3.2. Harmonization -- Abstract Test Suites

The most important element necessary to set up a testing activity is the availability of ATSs. The European Community (EC) has invested an enormous amount of funds to help the development of ATSs. The U.S. has not been able to match the European effort. NIST/CSL recognizes the outstanding work performed in Europe and has promoted the use of the resulting ATSs. The Testing Program intends to provide some level of support in the maintenance of these ATSs and, in certain areas, to contribute to the design of new ATSs. The quality system in place in the GOSIP Testing Program will allow NIST/CSL, with contributions from the OSI testing laboratories and the OIW, to review the ATSs, and provide defect reports and solutions to the European maintenance authorities. An exchange process has been implemented between the Open Systems Testing Consortium (OSTC) and NIST/CSL to facilitate this activity.

3.3. Harmonization -- Means of Testing

The Testing Program has set up a comprehensive MOT qualification process [6]. This process is unique in terms of scope and focus toward quality. NIST/CSL believes this process will allow a substantial improvement of MOTs and contribute to the European effort in this area. NIST/CSL, JITC, COS OSI Testing Policy & Evaluation Executive Interest Group (EIG), ACERLI and OSTC have started a concrete exercise intended to eliminate differences in the MOTs qualification process. Today MOTs are assessed in Europe following the OSTC and NIST/CSL procedures. This duplication puts some burden on the MOT suppliers. NIST/CSL hopes these discussions will result in an accommodation with OSTC which will allow the two processes to be technically equivalent and provide the same level of quality in their results.

3.3.1. Harmonization Exercise Description and Objectives

NIST/CSL, JITC, ACERLI (in France) and OSTC agreed to perform an exercise using the X.25 technical area in order to better understand the difference between their MOT validation process. The decision was approved by the OSTC Management Board on February 17, 1993. In May 1993, the COS OSI Testing Policy & Evaluation Executive Interest Group (EIG) joined the exercise.

The exercise consists in a mutual evaluation of both methodologies as well as their output (i.e., MOT validation report) using the Hewlett Packard IDACOM PT500 test tool. Both organizations provided all the necessary documentation to achieve this goal including their validation methodology and related documents and the PT500 validation reports. While OSTC limited the initial scope of the exercise to harmonization in the X.25 technical area, NIST/CSL in agreement with all parties involved in North America has broader objectives. At the end of the exercise -- end of 1993 -- NIST/CSL, JITC, ACERLI and OSTC will adjust their MOT validation methodologies to remove the major differences. The resulting MOT validation methodology will be presented to the North American Open Systems Testing and Certification Policy Council for endorsement. At that time, together NIST/CSL, the Council and OSTC should be in a position to declare that both methodologies are mutually acceptable.

3.3.2. Next Step

From the NIST/CSL, JITC and ACERLI points of view, a few additional barriers will need to be removed before a mutual-recognition agreement is designed, approved and signed between NIST/CSL and OSTC. NIST/CSL will begin another round of discussions with OSTC to obtain a better understanding of which entities OSTC allows to perform MOT validation. The concerns in this area hinge on the removal of potential conflicts of interest when MOT developers are involved in their own tool assessment. In the interim, NIST/CSL may nominate FTZ as an approved MOT Validation Laboratory for X.25. Finally, NIST/CSL and JITC plan to offer the North-American MOT Validation Methodology to ISO in order to reach an international consensus on this important problem.

3.4. Harmonization -- Laboratory Accreditation Procedures

The most important element necessary to achieve mutual recognition of test results relies on mutual-recognition agreements between the various national accreditation bodies. The National Voluntary Laboratory Accreditation Program (NIST/NVLAP) in the United States and the Standard Council of Canada (SCC) are the North American entities involved in the accreditation of IT laboratories. NIST/NVLAP and SCC are cooperating to set up a laboratory accreditation program for OSI in Canada.

Two major steps towards the realization of mutual-recognition agreements between NIST/NVLAP and its EC counterparts have been achieved this past year. First, NIST/NVLAP has participated in an ECITC and the Western

European Laboratory Accreditation Cooperation (WELAC) project to develop the *Interpretation of Accreditation Requirements as Specified in ISO/IEC Guide 25 for Information Technology Test Laboratories for Software and Communications Testing Services* [7]. This document provides a common understanding of the requirements for IT laboratories between the EC accreditation bodies and NIST/NVLAP. NIST/NVLAP has integrated this document in its procedures. Second, NIST/NVLAP has been conducting a process that is resulting in an upgrade of its procedures in order to guarantee that all NIST/NVLAP accredited laboratories are fully compliant with ISO Guide 25 [5] and the intersection between ISO Guide 25 and ISO 9000 [8]. This alignment with international requirements will remove the major barriers to mutual-recognition agreements. With these two major steps, SCC and NIST/NVLAP will be at the same level as their European counterparts for IT.

3.5.   Harmonization -- Product Registration

In North America there is only one registration/certification scheme in place: the GOSIP Test Program product registration scheme. On April 27, 1993, COS made the decision not to duplicate existing elements of the GOSIP Program with a COS Test and Registration Program, and to discontinue the use of the COS Certification Mark with all of these programs.

JITC, as the Agent of NIST/CSL, is the Product Registration Authority. JITC has in place an independent, comprehensive and high-quality test report review process. The objectives of this review are twofold: (1) the suitability of the products to the relevant profiles and (2) the guarantee that the laboratories perform to the level of quality required (i.e., proficiency evaluation)

Any progress towards mutual recognition of certificates/registers is guided by a set of principles that NIST/CSL put forward when negotiating with COS before the COS Mark disappeared. These principles provide a base for discussion/negotiation with other OSI Certification Schemes (OCS) and are to guide the design of mutual-recognition agreements between the GOSIP Testing Program OSI Product Registration Scheme and any other OSC.

These general principles do not address specific means by which a certified OSI product will be included in the Register of GOSIP Compliant Products. A specific list of documents (i.e., Protocol Conformance Test Report, System Conformance Test Report, PICS, PIXIT, etc.) will have to be clearly identified by each party. The specific costs of registration/certification will also need to be defined. These principles do not address derived product registration.

- **Principle 1 -- Common Laboratory Accreditation Procedures**: The OCS must be based on conformance testing performed in an accredited laboratory and using means of testing registered by the GOSIP Testing Program. The relevant accreditation bodies must be approved by NIST/CSL.

  NIST/NVLAP is an approved accreditation body. SCC will become an approved accreditation body subject to the implementation of its OSI laboratory accreditation scheme and a review the mutual recognition agreement between NIST/NVLAP and SCC signed under the Canada-US Free Trade Agreement. Any accreditation body for which there exists a mutual-recognition agreement covering IT/OSI with NIST/NVLAP and SCC (i.e., multilateral agreement) will be approved by NIST/CSL.

- **Principle 2 -- Maximum Coverage of the Abstract Test Suite**: NIST/CSL requires the OCS to base its certification scheme on test reports that maximize the coverage of the abstract test suite. Indeed the abstract test suite is the Standard Reference Material (SRM). Full equivalence of means of testing can only achieved when all the tools implement correctly 100% of the SRM. During a test campaign, It is not acceptable to deselect correct executable test cases for means of testing equivalence purpose.

- **Principle 3 -- Assessment/Evaluation of OCS**: NIST/CSL reserves the right to evaluate whether the OCS meet requirements for Quality, Reliability and Independence.

- **Principle 4 -- Reciprocity**: Any mutual recognition agreement between NIST/CSL and an OCS must be based on the reciprocity principle. Specifically, clear means to achieve acceptance of OSI Product Test Reports from and to the OCS must be fully defined and agreed upon.

- **Principle 5 -- Quality**: An OCS which meets ISO 9002 requirements satisfies NIST/CSL criteria for quality.

- **Principle 6 -- Reliability**: Reliability is an integral part of the NIST/CSL initial assessment of the OCS. To guarantee the quality of the information propagated in the *Register of Conformance Tested Products*, NIST/CSL intends to assess whether the OCS is continuously reliable. To achieve this goal, NIST/CSL or its agent will randomly select and evaluate some of the OSI product documentation (i.e., test reports) provided by the OCS.

- **Principle 7 -- Independence**: Independence from undue influence must be guaranteed. In particular, an OCS that also performs OSI Conformance Testing must demonstrate that technically competent staff independent from the Testing Business Unit is available to review test reports and deliver certificates.

- **Principle 8 -- Vendor Initiative:** Any mutual-recognition arrangement between NIST/CSL and an OCS must clearly specify the mechanisms that can be used by any OSI Product Vendor to obtain a Register Entry or a Certificate. The actual registration or certification request is the responsibility of the vendor.

4.   Conclusion

The North American Open Systems Testing and Certification Policy will provide the means to establish a regional consensus on OSI testing and certification policies, but also will support the other regional negotiating bodies, and serve as a regional negotiating body to achieve global agreements on such policies. Achieving the former will ensure a common approach to testing and certification which balances the interests and perspectives of the various elements of the indigenous OSI community. Achieving the latter will permit those interests to be better represented in the global equivalent of that community.

NIST/CSL has established a comprehensive and high quality testing program with the help of the user and vendor communities. Today the GOSIP Testing Program covers most of the protocols mandated in GOSIP Version 2. More than 37 MOTs have been assessed for GOSIP Version 2 and registered, 16 laboratories have been accredited to conduct OSI testing, 2 laboratories have been approved to conduct MOT validation -- JITC and ACERLI, more than 180 products have passed the registration process, and 2 interoperability services have been registered (e.g., PSI and OSINET).

Internationally agreed upon standard profiles are needed.   With three regions of the world making implementation agreements and with government sector procurements throughout the world requiring OSI, the penalty for unnecessary divergence is a market fragmentation that bodes ill for the prospects of international interoperability and for the potential of an integrated, open world market for information technology products and services. The jobs of product development, test system creation, and operational deployment become more difficult, more expensive, and less beneficial, as the diversity among standards increases.

The benefits of uniform testing requirements are apparent. If a vendor can build a product, test it once, and then have the product and test results accepted throughout the world, the cost of product development will be significantly reduced. Thus, we need to produce a set of tests, test methods, and testing procedures that will be accepted around the world. The Council and NIST/CSL believe the first window of opportunity for aligning OSI testing requirements between the U.S. and Europe comes now, when they have the appropriate bodies and a quality testing program in place in North America. The North American message is that an alignment must occur if we are to achieve the benefits of uniform testing requirements.

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